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New records of *Passiflora* from Itatiaia National Park, Brazil

Suellen Nunes Sarmento[1], Ana Carolina Mezzonato-Pires[2], Marcelo Trovó[1]

1 Universidade Federal do Rio de Janeiro, Instituto de Biologia, Departamento de Botânica, Laboratório Integrado de Sistemática Vegetal, Rio de Janeiro, RJ, Brazil • SNS: suellenunes017@gmail.com • MT: martrovo@gmail.com

2 Universidade Federal de Juiz de Fora, Departamento de Botânica, Juiz de Fora, MG, Brazil • ACMP: carolina.mezzonato@gmail.com

* Corresponding author

Abstract

We present new records of Passifloraceae *sensu stricto* from Itatiaia National Park, Brazil, contributing new data on the geographic distribution of four *Passiflora* L. species to the flora of Brazil: *P. deidamioides* Harms, *P. miersii* Mast., *P. rhamnifolia* Mast., and *P. setulosa* Killip. The last three species are reported from Itatiaia National Park and the last species from the state of Rio de Janeiro for the first time.

Keywords

Atlantic Forest, distribution, flora, maracujá, Passifloraceae, Rio de Janeiro, taxonomy

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Introduction

Passifloraceae *sensu lato* belongs to Malpighiales and currently include Passifloraceae *sensu stricto*, Turneraceae, and Malesherbiaceae (APG IV 2016). Passifloraceae *s.s.* comprises 17 genera, with *Passiflora* L. as the most diverse, containing 576 species, which are mostly distributed in the Neotropics (Feuillet and MacDougal 2007; Pérez and d'Eeckenbrugge 2017). According to recent phylogenetic studies, *Passiflora* is divided into five subgenera: *P.* subg. *Astrophea* (DC.) Mast., *P.* subg. *Deidamioides* (Harms) Killip, *P.* subg. *Decaloba* (DC.) Rchb., *P.* subg. *Passiflora*, and *P.* subg. *Tetrapathea* (DC.) P.S. Green. (Krosnick et al. 2013), with the proposed inclusion of a new subgenus, *P.* subg. *Tryphostemmatoides* (Muschner et al. 2012).

In Brazil, there are 163 species (87 endemic) of *Passiflora* recorded, which are distributed among four subgenera: *P.* subg. *Astrophea* (32 spp.), *P.* subg. *Deidamioides* (6 spp.), *P.* subg. *Decaloba* (28 spp.), and *P.* subg. *Passiflora* (97 spp.) (Cervi 1997; Milward-de-Azevedo et al. 2012; Bernacci et al. 2020; Mezzonato-Pires et al. 2020). *Passiflora* species occur in various phytophysiognomies, many of which are typical forest formations at various altitudes, especially in the Atlantic Forest biome. Itatiaia National Park is the first conservation unit created in Brazil and is one of the most important remnants of the Atlantic Forest in the Southeast Region, harboring numerous endemic species (ICMBio 2013).

Here we present new records from Itatiaia National Park of four species of the genus *Passiflora*. The new data were obtained through fieldwork carried out for the project entitled "Passifloraceae *s.s.* from the Itatiaia National Park, Brazil" (unpublished). *Passiflora rhamnifolia* Mast. (*P.* subg. *Astrophea*) and *P. deidamioides* Harms (*P.* subg. *Deidamioides*) are reported for the first

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time from this conservation unit and this is also the time that their subgenera are reported from the area studied. Furthermore, new records of *P. miersii* Mast. from the park and the first record of *P. setulosa* Killip (*P.* subg. *Passiflora*) from the state of Rio de Janeiro are reported.

Methods

We analyzed in person the collections at CESJ, HB, R, RB, and RFA herbaria and the virtual collections on the Jabot (http://jabot.jbrj.gov.br/), Reflora (http://reflora.jbrj.gov.br/), and SpeciesLink (http://www.splink.org.br/) platforms. Descriptions were made using a stereoscopic microscope. Data used in the description of the fruits of *P. deidamioides* and *P. rhamnifolia* were taken from Bernacci (2003) and Mezzonato-Pires et al. (2020), respectively. Measurements of the internal structures of the flowers and fruit of *P. setulosa* were taken from Cervi et al. (1983) and Cervi and Linsingen (2008).Terminologies used for description are in accordance with Killip (1938), Radford (1974), and Feuillet and MacDougal (2003). Identification of the specimens was carried out based on the protologs and publications provided by Killip (1938), Bernacci et al. (2003), and Mezzonato-Pires et al. (2020). Previously known occurrence data were obtained from materials in collections. At least one point per locality and only materials observed by the authors were considered. New occurrence records were obtained from collections made by us. The geographic distribution maps (Fig. 1) were made using Quantum GIS v. 3.18.

Results

New geographical distribution data are presented for four species belonging to the genus *Passiflora* (Fig. 1): *P. deidamioides* and *P. miersii* are newly recorded from Itatiaia National Park; *P. rhamnifolia* is reported for the first time within the limits of the Mantiqueira Mosaic, collected in the Itatiaia National Park area; and *P. setulosa* is recorded for the first time from the state of Rio de Janeiro.

Passiflora deidamioides Harms

Figure 2A–C

New records. BRAZIL – **Rio de Janeiro** • Itatiaia, Parque Nacional do Itatiaia (summit, Três Picos Trail); 22°25′31.5″S, 044°34′59.4″W; 22.IV.2021; S.N. Sarmento 13 leg.; RB.

Additional material examined. BRAZIL – **Minas Gerais** • Lima Duarte, Parque Estadual de Ibitipoca; 08.IX.1994; F.R.G. Salimena et al. leg.; CESJ 27554 • same locality; 21°42′33″S, 043°53′46″W; 04.II.2004; R.C. Forzza et al. 2640 leg.; RB – **Rio de Janeiro** • Petrópolis, APA Petrópolis; 22°24′17″S, 043°13′43″W; 18.XI.2009; R. Borges et al. 994 leg.; RB • Petrópolis, Serra dos Órgãos PARNASO; 22°28′22″S, 043°04′41″W; 1558 m alt.; 01.V.2019; T.C. Alves 99 leg.; RBR • Teresópolis; 03.XI.1929; A.C. Brade 9850 leg.; PEL • Nova Friburgo, Reserva Ecológica Municipal de Macaé de Cima, Trail to the spring of the Flores River; 22°33/22°38S, 042°30/042°34W; E.L. Jacques 254 leg.; RB • Paraty, Cairuçu Peak; 25.XI.1990; C. Farney 2577 leg.; RB – **São Paulo** • Salesópolis, Parque Estadual da Serra do Mar (intermediate road km 45); 23°38′S, 045°41′W; 25.IV.2000; W. Foster et al. 319 leg.; ESA • same locality; 04.III.2004; L.C. Bernacci and H. Lorenzi 3652 leg.; HUEFS • São José do Barreiro, Serra da Bocaina; 02.VI.2010; A.C. Cervi et al. 9500 leg.; HCF • same locality; 22°38′24.0″S, 044°34′12.0″W; 06.III.2010; J. Cordeiro and J.M. Silva 3487 leg.; MBM • São Francisco, Capão behind Boa Vista; 21.XII.1896; A.C. Silva CGG 3504 leg.; SP • Santo André, High of the mountain biological station; 02.VI.1920; A. Gehrt leg.; SP 4592 • Ubatuba, Peak of Corcovado; 23°26′54.6″S, 045°11′35.4″W; 27.IV.2010; L.C. Bernacci et al. 4718 leg.; IAC.

Identification. Woody lianas, glabrous. **Branches** cylindrical, brown. **Stipules** ca. 0.8 × 1 mm, falcate, usually early deciduous, margins entire, apex acute; petioles 2.8–3.4 cm long, glabrous, with one to two pairs of opposite glands, one pair located in the upper portion (near the base of the leaf blade) and the second in the lower portion. **Leaf blades** compound, trifoliolate, leaflets ovate to elliptical, central leaflet 2.5–2.6 × 5.6–5.8 cm, lateral leaflets 2.3–2.5 × 5.3–6 cm, subcoriaceous to membranous, diverging at an angle of 90°, base asymmetrical to acute, apex obtuse to emarginate, margins entire, cartilaginous, veins glabrous. Peduncles 13.8–25.5 mm long. Bracts 1.5–2.6 × 0.2 mm, alternate, linear, margins entire, persistent in the flower. Pedicels 6.5–8.6 mm long. **Inflorescences** in dichasia. **Flowers** ca. 3.3 cm diam.; sepals 11.9–12.3 × 4.3–5.7 mm, oblong-lanceolate, white to greenish; petals 9.1–11.7 × 5.3 mm, oblong, white; corona with 3-5 series of filaments; outer filaments 10.3–8.6 × 0.3 mm, filiform, whitish to pinkish; inner filaments 2.2–2.3 × 0.05–0.1 mm, filiform, white to pinkish, apex linear; operculum with lobed apex; limen ca. 1 mm long; trochlea absent; androgynophore ca. 7.2 mm long; ovary obovoid, glabrous. **Fruits** 6–8 × 3–4 cm, obovoid-ellipsoid; seeds asymmetrically obovoid-obloid, reticulate.

Comments. *Passiflora deidamioides* is the type species of *P.* subg. *Deidamioides* (Killip 1938). It is endemic to Brazil, found in the states of Minas Gerais, Rio de Janeiro, and São Paulo (Bernacci et al. 2020). It has scarce occurrence records in remnant areas of the Atlantic Forest Biome, mainly from Serra da Bocaina National Park (SP), Serra dos Órgãos National Park (RJ), Ibitipoca State Park (MG), and Macaé de Cima Municipal Ecological Reserve (RJ) (Milward-de-Azevedo 2007; Bernacci et al. 2020; Moraes et al. 2020). The first record of occurrence of this species in Itatiaia National Park was made in a transition area between dense montane and high montane Ombrophilous Forest with intense light at 1600 m altitude.

In other regions, this species has been observed flowering from September to April and fruiting from

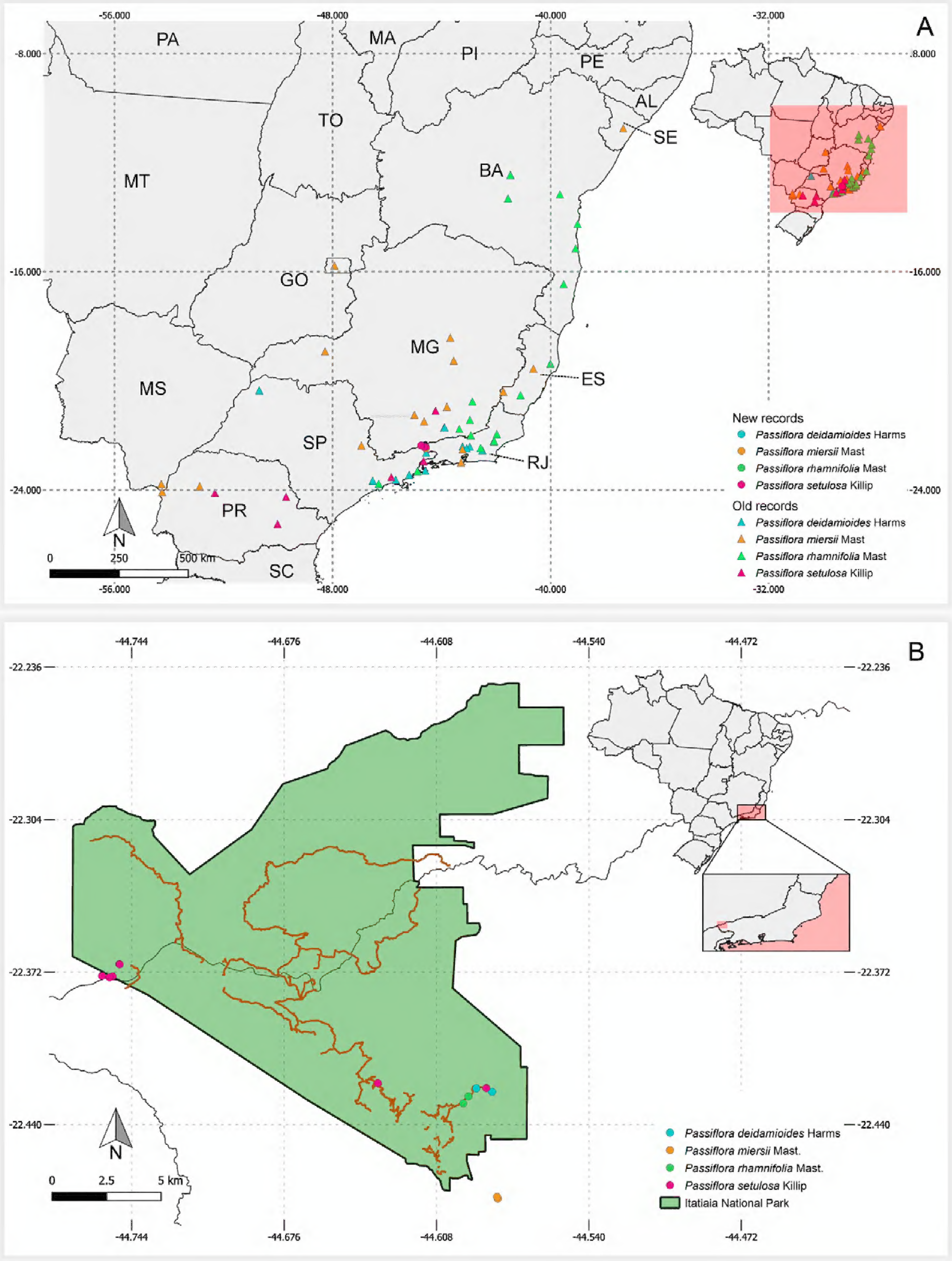

Figure 1. A. Maps of previously known occurrences of the species in Brazil. **B.** and detail of the new records in Itatiaia National Park. Map: IBGE Unidades da Federação.

December to June (Bernacci et al. 2020). *Passiflora deidamioides* differs from other species of Itatiaia National Park for having trifoliolate compound leaves, dichasial inflorescences, and a corona composed of 3–5 series of filaments.

***Passiflora miersii* Mast.**

Figure 2D–F

New records. BRAZIL – **Rio de Janeiro** • Itatiaia, Itatiaia National Park Road, near the gatehouse; 22°28′20.1″S, 044°34′51.5″W; 22.III.2020; S.N. Sarmento 18 leg.; RB

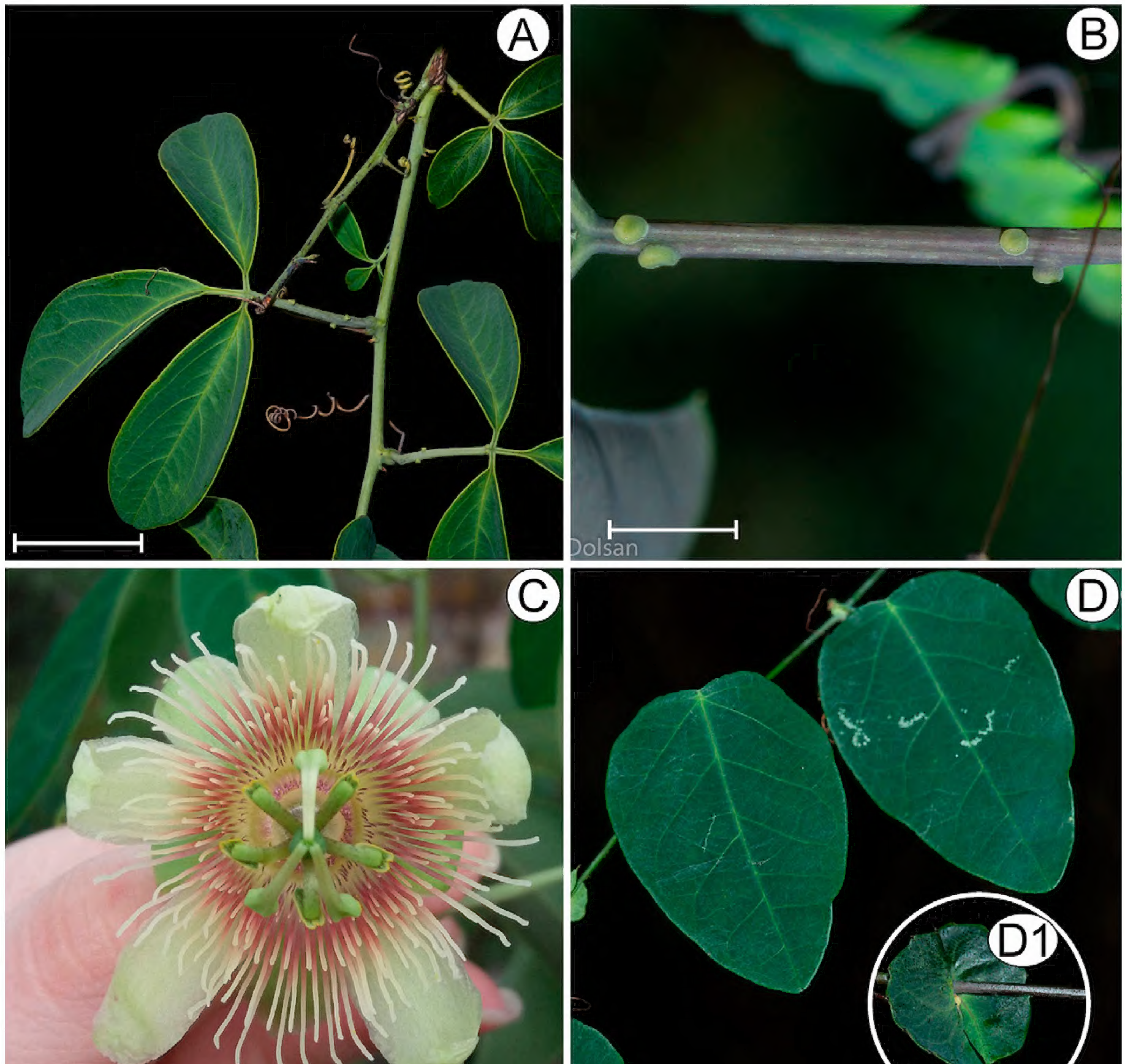

Figure 2. New records of *Passiflora* from the Itatiaia National Park. **A–C.** *Passiflora deidamioides* Harms. **A.** Leaf blade. **B.** Detail of the petiole glands. **C.** Flower. **D–F.** *Passiflora miersii* Mast. **D.** Leaf blade. **D1.** Detail of stipules. **E.** Flower. **F.** Longitudinal section of the flower. Scale bars: A = 2 cm; B = 0.7 cm; C = 1 cm; D = 3 cm; D* = 0.5 cm; E = 1 cm; F = 0.25 cm. Photographs by Hugo Dolsan (A–B, D–F), A.C. Mezzonato (C).

• same locality; 01.V.2020; S.N. Sarmento 19 leg.; RB • Itatiaia, Itatiaia National Park Road, park buffer zone near the first bridge of Campo Belo river; 22°28′23.0″S, 044°34′50.3″W; 30.IV.2021; S.N. Sarmento 20 leg.; RB.

Additional material examined. BRAZIL – **Espírito Santo** • Alegre, Parque Nacional do Caparaó; 20° 23′48,3″S, 041°44′07,9″W; 22.II.2000; V.C. Souza 23701 leg.; ESA • Colatina, Serra sete de Maio, Água Branca road 64km of Colatina; 07.V.1934; J.G. Kuhlmann 324 leg.; RB – **Mato Grosso do Sul** • Eldorado; 14.III.1985; G. Hatschbach et al. 49006 leg.; MBM – **Minas Gerais** • Carrancas, Serra de Bicas; 21°29′15.0″S, 044°38′33.0″W; 14.III.1999; A.O. Simões et al. 744 leg.; UEC • Lavras, near to the city; 09.XII.1980; H.F. Leitão Filho 11716 leg.; UE • Diamantina, Serra do Espinhaço, ca. 8 km N of Gouveia on road to Diamantina; 18°24′56.7″S, 043°41′01.0″W; 1220 m alt.; 04.II.1972; W.R. Anderson 35316 leg.; NY • Carandaí; 25.XI.1946; A.P. Duarte 636 leg.; NY • Uberlândia, Irara Farm; 18°55′07.0″S, 048°16′37.9″W; 17.VI.2010; B.C. Vargas and G.M. Araújo 165 leg.; HUFU • Sete Quedas, Guaíra; 30.IX.1980; G. Hatschbach 43196 leg.; MBM • Santana do Riacho, Serra do Cipó; 23.XI.2000; SPF – **Paraná** • Tuneiras do Oeste; 04.X.2004; M.G. Caxambu 589 leg.; HCF – **Rio de Janeiro** • Distr. of Frade, Trail to the peak; 19.XI.2002; M.G. Bovini 2233 leg.; RB • Rio de Janeiro, Parque Nacional da Tijuca; 21.III.1977; G. Martinelli 1337 leg.; RB • Petrópolis; 08.IX.1991; R. Marquete 370 leg.; RB – **São Paulo** • Mogi Guaçu, Campininha farm; 24.IX.1980; E. Forero 8371 leg.; UEC – **Sergipe** • Areia Branca, High of Atabaiana Mountain; 27.I.1983; E.M. Carneiro 476 leg.; ASE.

Identification. Herbaceous vines, glabrous. **Branches** cylindrical, greenish. **Stipules** ca. 0.5 × 1.5 cm, reniform, persistent, margins crenulate, apex aristate 1–2 mm long; petioles 2–2.5 cm long, glabrous, with a pair of alternate glands, located in the median portion. **Leaf blades** simple, entire, oval-lanceolate, ca. 3 × 5.5–6.5 cm, membranous to subcoriaceous, base rounded, apex rounded to acute, rarely aristate ca. 1 mm long, margins serrate at base and entire at apex, veins glabrous. Peduncles ca. 6 cm long. Bracts ca. 2 mm long to inconspicuous, opposite, linear-subulate, margins entire, persistent in the flower. Pedicels ca. 1 cm long. **Inflorescences** uniflorate. **Flowers** ca. 4.5 cm in diameter; sepals 0.8 × 2.5 cm, oblong-lanceolate with arista ca. 2 mm long, greenish; petals ca. 0.4 × 2–2.3 cm, oblong-lanceolate, white to lilac; corona with four series of filaments; outer filaments in two series 1–1.5 cm long, filiform, white and purple banded; inner filaments in two series, 3–4 mm long, capitate, white, with a purple bifid apex; operculum with filamentous apex; limen ca. 1 mm long; trochlea absent; androgynophore ca. 6 mm long; ovary ellipsoid, glabrous. **Fruits** ca. 1.5 × 2.5 cm, ovoid to ellipsoid; seeds obovoid, reticulate.

Comments. *Passiflora miersii* belongs to *P.* subg. *Passiflora* (Cervi 1997). It is endemic to Brazil and is distributed in the states of the Northeast (Bahia and Sergipe), Central-west (Distrito Federal and Mato Grosso do Sul), South (Paraná), and Southeast regions (Espírito Santo, Minas Gerais, Rio de Janeiro, and São Paulo) (Cervi 1997; Bernacci et al. 2020). It has been reported in vegetation of Cerrado (*sensu lato*), Semideciduous Seasonal Forest, forest edges, roads and anthropic areas, in the phytogeographic domains of Caatinga, Cerrado, and Atlantic Forest (Cervi 1997; Bernacci et al. 2003, 2020). This species is threatened regionally in the states where it occurs, due to its disjunct and sporadic distribution (CNCFlora 2012). However, it is not threatened on a national scale (CNCFlora 2012). In Itatiaia National Park, it was collected at 600 m altitude in anthropic areas with constant maintenance and pruning, in the forest edges near the road, and it was found in both the park and the surrounding buffer zone.

The species was recorded flowering in May and fruiting between March and June, and it has been described in other studies as flowering from September to January and fruiting from February to May (Cervi 1997). It is recognized and differs from the other species mainly by presenting entire ovate-lanceolate leaves with a purplish abaxial surface, bracts usually linear-subulate to inconspicuous, and flowers purplish, with four series of banded filaments and filamentous operculum at the apex. The bracts of *P. miersii* have some morphological variations, as described in the literature (Killip 1937). Among the materials analyzed, specimens from other regions were observed with exuberant ovate foliaceous bracts, while in Itatiaia National Park specimens were collected with inconspicuous to linear-subulate bracts.

Passiflora rhamnifolia Mast.

Figure 3A–C

New records. BRAZIL – **Rio de Janeiro** • Itatiaia, Três Picos Trail, Itatiaia National Park; 22°25′38.9″S, 044°35′37.6″W; 22.IV.2021; S.N. Sarmento 12 leg.; RB • same locality; 22°25′50.1″S, 044°35′45.8″W; 22.IV.2021; S.N. Sarmento 11 leg.; RB.

Additional material examined. BRAZIL – **Bahia** • Palmeiras, Parque Nacional da Chapada Diamantina; 12°27′08.0″S, 041°28′33.0″W; 24.IV.2014; A.C. Mezzonato 71 and M. Milward leg.; R • Porto Seguro, Brazil Holland Industry Reserve S/A. Entrance at km 22 of the Eunápolis-Porto Seguro; 16°27′45.0″S, 039° 31′18.8″W; 07.IV.1994; J.G. Jardim 393 leg.; NY • Una, Reserva Ecológica do Mico-Leão (IBAMA); 15°09′S, 039°05′W; 28.XI.1993; M.A. André et al. 1566 leg.; NY • Uruçuca, Serra Grande forest inventory study site; 039°01′W, 14°25′S; 02.II.1992; W.W. Thomas et al. 9038 leg.; NY • Amargosa, Serra do Timbó; 13°9′53″S, 039°39′31″W; 04.VIII.2007; J.L. Paixão 1349 and M.S. Nascimento leg.; HUEFS • Piatã, Serra de Santana; 13°18′42″S, 041°33′45″W; 08.I.2006; T.S. Nunes et al. 1478 leg.; HUEFS • Palmeiras, Parque Nacional da Chapada Diamantina; 12°27′07.0″S, 041°28′34.0″W; 24.IV.2014; A.C. Mezzonato 72 and M. Milward leg.; R

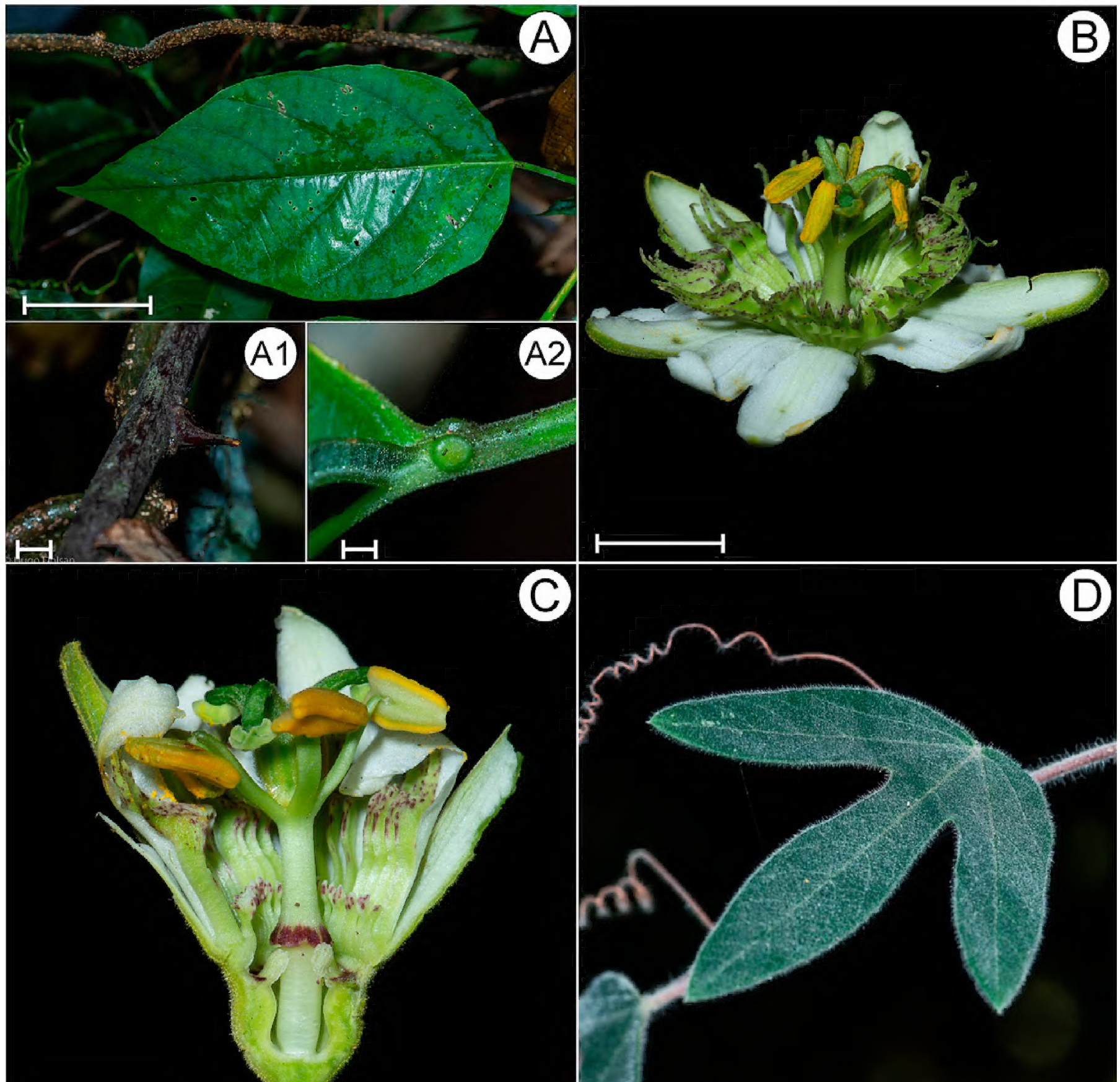

Figure 3. Photographs of new records of *Passiflora* from the Itatiaia National Park. **A–C.** *Passiflora rhamnifolia* Mast. **A.** Leaf blade. **A1.** Detail of the branch. **A2.** Detail of petiole glands. **B.** Flower. **C.** Longitudinal cut of the flower. **D–F.** *Passiflora setulosa* Killip. **D.** Leaf blade. **E**. Detail of the stipules and petiole glands. **F.** Detail of flower buds and bracts. Scale bars: A1 = 4 cm; A2 = 1 cm; A3 = 0.5 cm; B = 0.7 cm; C = 0.5 cm; D = 2 cm; E = 0.7 cm; E* = 0.1 cm; F = 0.7 cm. Photographs by Hugo Dolsan.

• Palmeiras, Pai Inácio; 12°27′20″S, 041°28′15″W; 1100 m alt.; 27.XII.1994; E.S. Santos et al. 1391 leg.; SPF – **Espírito Santo** • Castelo, Parque Estadual do Forno Grande; 20°31′37″S, 041°06′6″W; 1250 m alt.; 13.II.2008; L. Kollmann et al. 10598 leg.; RB • Linhares, Natural Reserve of CVRV Calimã; 12.07.1990; D.A. Folli 1245 leg.; HUEFS – **Minas Gerais** • Descoberto, Reserva Biológica Represa do Grama; 23.I.2001; R.C. Forzza 1735 leg.; UEC • Viçosa, State Agricultural School; 06.XII.1958; H.S. Irwin 2222 leg.; NY • Juiz de Fora, Campus UFJF; 21°45′51.1″S, 043°21′01.1″W; 14.XI.2013; A.C. Mezzonato 63 and Y. Tavares leg.; R – **Rio de Janeiro** • Sapucaia; 22°04′42″S, 042°61′09″W; 759 m alt.; 08.I.2001; F.B. Pereira 46/6 leg.; RB • Nova Friburgo, Reserva Ecológica Municipal de Macaé de Cima; 22°33/22°28S, 042°30/042°34W; 13.VIII.1990; S.V.A. Pessoa et al. 536 leg.; RB • same locality; 22°0S, 04°2/03°W; 17.VIII.1989; C.M. Vieira et al. 64 leg; NY • Macaé, Peak of Frade; 08.VIII.1985; S.V.A. Pessoa 52 leg.; RB • Santa Maria Madalena, road to Fazenda do Ribeirão Vermelho; 20.V.1990; A.F. Vaz 832 leg.; RB – **São Paulo** • Santo André, Paranapiacaba, Alto da Serra Reserve trail 27; 23°46′16.3″S, 046°18′25.8″W; 835 m alt.; 02.II.2004; L.C. Bernacci et al. 3606 leg.; HB • Serra da Bocaina, Sertão da Bocaina next Casa do Peixe; 09.II.1959; G.F.J. Pabst 4742 leg.; HB.

Identification. Woody lianas, pubescent. **Branches** cylindrical, brown to greenish. **Stipules** ca. 0.5 × 0.5 mm, setaceous, sometimes deciduous, margins entire, apex acute; petioles 3–3.7 cm long, puberulous, a pair of glands located laterally at the apex of the petiole. **Leaf blades** simple, entire, ovate, 6.5–7.8 × 11.4–12.7 cm, membranous, base rounded, apex rounded to acuminate, margins entire to slightly undulate, veins densely puberulous. Peduncles 3.4–4.9 cm long. Bracts ca. 0.4 × 1 mm, alternate, linear, margins glandular, early deciduous. Pedicels 0.9–1 cm long. **Inflorescences** uniflorate. **Flowers** ca. 3.9 cm diam.; sepals 1.6–1.8 × 0.6–0.7 cm, oblong, white to greenish; petals 1.1–1.4 × 0.3–0.5 cm, oblong, white; corona with two series of filaments; outer filaments 1–1.3 cm long, dolabriform, greenish with vinaceous maculae; inner filaments ca. 4 mm long, filiform, greenish with vinaceous maculae, apex entire to bifid; operculum membranous with free apex; limen absent; trochlea ca. 1 mm long, fusiform, vinaceous; androgynophore ca. 8 mm long; ovary obovoid to ellipsoid, with velutinous undulations in stripes. **Fruits** 2.1–2.4 × 1.7–3.2 cm, obovoid; seeds obovoid, reticulate.

Comments. *Passiflora rhamnifolia* belongs to *P.* subg. *Astrophea* (Mezzonato-Pires et al. 2020). It is endemic to Brazil and occurs in Dense Ombrophilous Forest, Campos Rupestres, and Savannas in the states of the Southeast Region and Bahia (Bernacci et al. 2020; Mezzonato-Pires et al. 2020). It is commonly collected in Chapada Diamantina (BA) and Espírito Santo, where it is known by its vernacular names "maracujá-de-cobra" and "maracujá-preto" (Mezzonato-Pires et al. 2020). In Itatiaia National Park, it was found growing in tree canopies between 4 and 10 m high and at the forest edge in a montane Dense Ombrophilous Forest formation at about 1400 m. altitude.

This species was observed flowering in April and fruiting in September. Studies indicate that the species can flower almost all year round or in a limited period for each area, and fruit in March, April and July through December (Mezzonato-Pires et al. 2020). *Passiflora rhamnifolia* differs from the other *Passiflora* species that occur in Itatiaia National Park by its woody habit, presenting entire leaves with puberulous indumentum, lateral glands at the apex of the petiole, white flowers with dolabriform outer corona filaments, and fusiform trochlea.

***Passiflora setulosa* Killip**

Figure 3D–F

New records. BRAZIL – **Minas Gerais** • Itamonte, Itatiaia National Park Buffer Zone; 22°22′25.8″S, 044° 45′09.2″W; 16.XI.2020; S.N. Sarmento 05 leg.; RB – **Rio de Janeiro** • Itatiaia, Ruy Braga Crossing; 22°25′17.3″S, 044°38′03.3″W; 21.III.2021; S.N. Sarmento 07 leg.; RB • Itatiaia, Três Picos Trail; 22°25′25.4″S, 044°35′08.8″W; 22.IV.2021; S.N. Sarmento 16 leg.; RB.

Additional material examined. BRAZIL – **Paraná** • Jaguariahyva; IV.1915; P.K. Dusén 16964 leg.; US (isotype) • Guabiroba river; 17.XI.1982; R. Kummrow 2090 leg.; NY • Campo Mourão, Lago Azul (PELA); 24°06′29,6″S, 052°19′11,5″W; 625 m alt.; 04.I.2008; M.G. Caxambu 1996 leg.; HCF – **São Paulo** • Salesópolis, borders of Parque Estadual da Serra do Mar; 23°31′55.9″S, 045°50′47.0″W; 17.III.2012; L.C. Bernacci et al. 4764 leg.; IAC • Serra da Bocaina; V.1957; A.C. Brade 21023 leg.; RB.

Identification. Herbaceous to woody lianas, densely hirsute. **Branches** cylindrical, brown. **Stipules** ca. 7 × 10 mm, ovate to reniform, persistent, margins serrate, apex mucronate; petioles 2.7–3 cm long, hirsute, with 3–8 glands, alternate, located at apex and median portion of petiole. **Leaf blades** simple, 3-lobed, lanceolate, 4.1–4.7 × 6.6–9.5 cm, united portion 1.9–2.3 cm long, central lobe 4.9–7.4 cm long, lateral lobes 3.8–4.3 cm long, membranaceous, diverging at an angle of 70°, base subcordate to rounded, apex acute to mucronate, margins entire, sometimes slightly serrate at base with glandular processes, veins densely hirsute. Peduncles 3.4–3.9 cm long. Bracts 1.3–1.5 × 2.4–2.6 cm, verticillate, ovate to lanceolate, margins serrate, persistent in the flower bud. Pedicels ca. 1 mm long. **Inflorescences** uniflorate. **Flowers** ca. 5 cm in diameter; sepals 1.8–2 × 0.6–0.8 cm, oblong-lanceolate, yellowish to orange; petals 1.6–1.8 × 0.5–0.7 cm, lanceolate to linear-lanceolate, white; corona filamentous, 3-seriate; outer filaments in two series, 1.2–1. 4 cm long, filiform, slightly violaceous in upper third; inner filaments uniseriate, ca. 2 mm long, filiform, white, with linear apex; operculum with filamentous apex; limen ca.

2 mm long; trochlea absent; androgynophore 6–8 mm long; ovary ellipsoid or ovoid, densely hairy. **Fruits** 3.5–4.0 × 2.5–3.0 cm, ellipsoid or ovoid; seeds ovoid, smooth with five short horns (prominences) at apex (four lateral and one central).

Comments. *Passiflora setulosa* belongs to *P.* subg. *Passiflora*. It is endemic to Brazil, and its occurrence is described for areas of Campo Limpo, Cerrado (*sensu lato*), and Semideciduous Seasonal Forest in the domains of Cerrado and Atlantic Forest (Bernacci et al. 2020). It occurs in the states of Paraná and São Paulo, and is considered a rare species (Bernacci et al. 2005; Martinelli et al. 2013). It is assessed as Endangered due to its scarcity of occurrences and intense anthropic impacts (CNCFlora 2012). In Itatiaia National Park, it was found in forest edges of dense montane Ombrophilous Forest at altitudes of 1600–1900 m in the portions of the park belonging to the states of Minas Gerais and Rio de Janeiro.

The species was found with flower buds between November and January, but it was not found fruiting in the following months. In other regions it has been found fruiting in January, April, and November. *Passiflora setulosa* differs from the other species mainly by presenting densely hairy branches, deeply trilobed leaves, three oval-lanceolate verticillate bracts with toothed margins, and white flowers with aristate sepals.

Discussion

The new records of *Passiflora* species presented here highlight the importance of floristic surveys and the need for greater efforts to collect the family in Brazilian biomes (Mezzonato-Pires et al. 2021). Although historically well-sampled, previous collecting efforts have been insufficient to catalog the diversity of Passifloraceae *s.s.* in Itatiaia National Park. The species previously catalogued from the park were mostly collected by researchers not dedicated to the study of the family, and in areas of relatively easy access, such as along roadsides and most commonly visited trails. Therefore, we infer that our more exploratory collections of Passifloraceae *s.s.* in Itatiaia National Park were essential for the discovery of important new records and new populations of species poorly known or considered rare, such as *Passiflora setulosa* and *P. deidamioides*.

Among the new records presented, *Passiflora deidamioides* and *P. rhamnifolia* are especially important, as our new data expand the ranges in Brazil of these two species. Moreover, the new occurrences of these species from Itatiaia National Park represent the first records of *P.* subg. *Deidamioides* and *P.* subg. *Astrophea*, respectively, from the park. Prior to this study, there were only records of species belonging to *P.* subg. *Passiflora* and *P. subg. Decaloba* in the area. The new records of *P. deidamioides* from Itatiaia National Park extends this species' distribution range to the state of Rio de Janeiro and the Serra da Mantiqueira. There were no records of *P. rhamnifolia* collected near the study area, and these are the first records of the species within the limits of the Mosaico da Mantiqueira and Itatiaia National Park.

Although relatively well collected in other areas of the Atlantic Forest biome, there were no records of *Passiflora miersii* in Itatiaia National Park, and our records are the first of the species in the region. Bernacci (2003) cited the possibility that *P. setulosa* is extinct in the states of Minas Gerais and São Paulo, but we shows that with more extensive collecting expeditions, more populations of the species may be found. Furthermore, *P. setulosa* is a poorly known taxon, with previous descriptions lacking details of flower morphology, as this species has been rarely found in flower or fruit (Killip 1938; Cervi et al. 1983, 2008; Bernacci 2003). Our records of *P. setulosa* extend the distribution of this species to the state of Rio de Janeiro and also add new populations in Minas Gerais.

Our results update the distribution of four species of *Passiflora* and will support conservation efforts of newly discovered populations. Increased collection efforts and new studies including more reliable data on the family are essential to accurately document the biodiversity and to advance knowledge of poorly known species of *Passiflora*.

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Authors' Contributions

Conceptualization: SNS, MT. Supervision: ACMP, MT. Writing – original draft: SNS. Writing – review and editing: SNS, MT, ACMP.

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